SUPERFUND RESPONSE ACTION PRIORITY PANEL REVIEW FORM

Date Form Completed: February 15, 2012

General Site Information

Region:	Region 8	City:	Superior	State:	MT
CERCLIS EPA ID:	MT0012694970		CERCLIS Site Name:	Flat Creek IMM Superfund Site	
NPL Status: (P/F/D)	F		Year Listed to NPL:	2009	

Brief Site Description: *(Site Type, Current and Future Land Use, General Site Contaminant and Media Info, Site Area and Location information.)*

The Flat Creek IMM Superfund Site (the site) is located in Mineral County, Montana (Figure 1). The Town of Superior (pop. 812) is located within the site boundaries. Superior is the County Seat of Mineral County. The site is divided into three operable units (OUs) (Figure 2). OU1 focuses on only the soils in residential and other areas throughout town. OU2 includes the watershed associated with the Flat Creek stream corridor, the Iron Mountain Mine and mill site, and the groundwater and surface water for all three operable units. OU3 is the Wood Gulch Repository that was constructed in 2011 specifically for the waste from the removal and remedial actions. EPA established OU1 to address areas of greatest human health risk as quickly as possible. That risk was from the soils in the town of Superior where tailings from the IMM had been imported as fill.

Contamination at the site originates at the Iron Mountain Mine (IMM) which is about 5 miles north of Superior in the Flat Creek watershed. It operated from 1909 to 1930 and again from 1947 to 1953, producing silver, gold, lead, copper, and zinc ores. During these years, waste materials such as waste rock and tailing were stockpiled on the property. From the 1940s to 1970s, these waste materials were transported to town by the local government and residents and used as fill in yards, roads, driveways, and other areas such as the school track and fairgrounds. The material had physical properties desirable for use as fill, and was readily available and free. Unfortunately the material contained high concentrations of metals and metalloids, particularly antimony, arsenic, and lead.

Because the waste material was used as fill for driveways, roads, and other structures, the contamination is generally found at or near the surface in areas that are generally unfenced and easily accessible. In driveways, the material is completely unvegetated. Where placed in yards or other areas, it is often sparsely vegetated which makes it vulnerable to erosion and provides a direct exposure pathway to children and adults.

There is no zoning in Superior, so all undeveloped properties have the potential to become residential. Superior has a small downtown and there is a typical array of commercial and municipal properties within the city limits. There are no manufacturing or industrial areas. Superior has a median household income of $25,333 and approximately 10.4 percent of the local families live below the poverty line.

General Project Information

Type of Action:	Remedial	Site Charging SSID:	08ER
Operable Unit:	OU1	CERCLIS Action RAT Code:	RA001

Is this the final action for the site that will result in a site construction completion? ☐ Yes ☒ No

Will implementation of this action result in the Environmental Indicator for Human Exposure being brought under control? ☒ Yes ☐ No

This action will reduce current and future risk to human health through removal and reclamation of residential properties that contain unacceptable levels of lead and arsenic in soils. These removals will also prevent future migration of contaminants to surface water and ground water.

Site/Project Name:	Flat Creek IMM Superfund Site

Response Action Summary

Describe briefly site activities conducted in the past or currently underway:

Environmental investigation at the site began in 1993 and continues today. The site was listed on the NPL in 2009 and EPA conducted a remedial investigation (RI) with field sampling in 2009 and 2010. Every property in Superior where access could be obtained (over 600 individual properties or almost 95 percent of the properties) were screened for selected mine waste.

Thirty-three of the properties screened had concentrations of lead (>3000 ppm) or arsenic (>400 ppm) which justified an emergency removal. EPA's Removal Group performed two time critical removal actions (TCRAs) - one in 2010 and another in 2011 - that addressed those highly contaminated properties. A previous TCRA was performed at the site in 2002 after the preliminary assessment/site inspection had been completed. At that time, an engineered repository had been constructed at the airport for the waste. The airport repository was permanently closed after the 2002 TCRA was completed. Contaminated soils removed in the 2010 TCRA were placed on top of the airport repository as a temporary stockpile until a permanent repository (the Wood Gulch Repository – OU3) was built north of town. Some of the materials excavated during the 2011 TCRA were placed in the Wood Gulch Repository.

The RI and FS reports were both completed in September 2011. A proposed plan was issued on October 3, 2011, with a public hearing on October 12, 2011; a public comment period ran until November 3, 2011. The draft ROD was prepared in early February 2012.

The ROD identifies potentially 39 residential and other properties (Figure 3) for cleanup of contamination in one or more sampling areas based on elevated concentrations of lead (>400 ppm), antimony (>130 ppm), and/or arsenic (>100 ppm). These remedial actions will reduce or eliminate the need for institutional controls, and move OU1 towards RA completion. Concentrations of arsenic and lead for the samples in the individual sampling areas that exceed the cleanup criteria are provided in Table 1.

Specifically identify the discrete activities and site areas to be considered by this panel evaluation:

EPA established OU1 to quickly address human health risk in the imported soils placed as fill throughout town. In 2010 and 2011, while the RI was being completed, EPA conducted emergency removals at the properties with the highest contamination (lead >3,000 ppm and arsenic >400 ppm).

The remediation described in the ROD addresses discrete activities within two main areas in OU1:

1. **Excavation, Disposal Backfill, and Restoration of Specific Areas at Residential and Other Properties Known to Have Unacceptable Concentrations of Lead and Arsenic**. Soil within individual sampling areas identified in the ROD as having concentrations in excess of 400 ppm of lead or 100 ppm of arsenic will be excavated and trucked to the Wood Gulch Repository for disposal. This includes discreet areas of residential and nonresidential properties. Superior has no zoning regulations, so all properties have the potential to be developed residential. Children and adults currently have easy access to these areas and vegetative cover varies significantly. The excavated areas will be backfilled and revegatated or covered with paving or gravel, as appropriate.
2. **Excavation, Disposal, and Restoration of Airport Repository in Superior.** Approximately 15,255 cubic yards of contaminated soil previously excavated from residential yards, schools, and other areas within Superior as part of Emergency Removals in 2002, 2010, and 2011 will be excavated from the airport repository and transported to the Wood Gulch Repository for final disposal. Soils removed in 2010 and 2011 were stockpiled at this repository for eventual move to a permanent repository.

Site/Project Name:	Flat Creek IMM Superfund Site

Briefly describe additional work remaining at the site for construction completion after completion of discrete activities being ranked:

- The remediation of residential and other area soils in Superior and final disposal of excavated wastes in the Wood Gulch Repository (as described above) is expected to fully address the known human health risk at the site.
- In the future, the remainder of the site (i.e., the watershed) will be investigated under a separate RI/FS but contamination in that OU is not be expected to represent a significant human health risk.
- Site-wide groundwater and surface water will also be investigated under OU2, but current information does not support the need for remediation of those media due to human health risk.

Response Action Cost

Total Cost of Proposed Response Action:

($ amount should represent total funding need for new RA funding from national allowance above and beyond those funds anticipated to be utilized through special accounts or State Superfund Contracts.)

Total Cost of Proposed Response Action: $1,496,000

Source of Proposed Response Action Cost Amount:

(ROD, 30%, 60%, 90% RD, Contract Bid, USACE estímate, etc…)

The proposed response action cost estimate is based on the ROD (feasibility study level) costs.

Breakout of Total Action Cost Planned Annual Need by Fiscal Year:

(If the estimated cost of the response action exceeds $10 million, please provide multiple funding scenarios for fiscal year needs; general planned annual need scenario, maximum funding scenario, and minimum funding scenario.)

FY13:$ $1,496,000 (Construction start: 4QFY12 and Construction end: 4QFY13).

Other information or assumptions associated with cost estimates?

The remedial design and associated construction cost estimates have not been started. This estimate is based on ROD (feasibility study level) costs and assumes 1 year to complete. Design costs are expected to be minimal if EPA's removal group performs the work.

Readiness Criteria

1. Date State Superfund Contract or State Cooperative Agreement will be signed (Month)?

June 30, 2012

2. If Non-Time Critical, is State cost sharing (provide details)?

Yes, details to be worked out in the SSC

3. If Remedial Action, when will Remedial Design be 95% complete?

Site/Project Name:	Flat Creek IMM Superfund Site

Depending upon the timing of funding, designs for the yard removals will be completed as early as May or June of 2012. Designs are expected to be similar to those used under previous TCRAs.

4. When will Region be able to obligate money to the site?

July 1, 2012

5. Estimate when on-site construction activities will begin:

Pending completion of remedial design and subcontracting for construction, the earliest anticipated construction start would likely be July 2012.

6. Has CERCLIS been updated to consistently reflect project cost/readiness information?

Yes

Criteria #1 - RISKS TO HUMAN POPULATION EXPOSED (Weight Factor = 5)

Describe the exposure scenario(s) driving the risk and remedy. Include risk and exposure information on current/future use, on-site/off-site, media, exposure route, and receptors:

- **Contaminants of Concern**. Unacceptable human health risks in Superior, Montana result from incidental ingestion of soils containing elevated concentrations of lead or arsenic. The highest risks have been addressed through emergency removals, but unacceptable risks remain in residential and other areas easily accessed by adults and children.
- **Media Impacted**. Contamination is present in imported soils placed in yards, driveways and other areas across OU1.
- **Exposed Populations**. The exposed populations are primarily children and adults who reside in the community of Superior. In 2010, the community had 239 children enrolled in local schools – 192 at the elementary school level.
- **Exposure Routes**. In many yards, vegetative cover is spotty or missing entirely and play areas are sometimes evident. In driveways, contaminated material is exposed at the surface with no cover. Children can be observed engaged in typical activities that disturb soil, especially where it is poorly covered. Those activities include: riding bikes, running, jumping, digging, and general roughhousing. Adults most frequently contact the soils through general yard maintenance and gardening. In addition, the act of driving over contaminated materials in the affected driveway areas has the potential for releasing airborne contamination and also for tracking it to other areas in town.
- **Current Risk**. There currently is unacceptable risk associated with soils that exceed EPA's cleanup goals of 400 ppm lead, 100 ppm arsenic, and 130 ppm antimony. This risk exists in portions of residential areas and other areas that could be developed as residential properties in the future.
- **Future Risk**. Soils that exceed EPA's cleanup goals represent a future risk if not remediated. Soils placed in the airport repository during the 2010 TCRA present a future risk because they are temporarily stockpiled above other waste and not properly placed in the permanent repository, Wood Gulch.
- **Number of Properties Proposed for Remediation**. Based on the current and future risk concerns expressed above, portions of 39 properties have been identified in the ROD for remediation. Remediation will generally involve removal of contaminated soils from a single sampling area (e.g., a driveway), which is generally <25 percent of the property, rather than the entire property.

Estimate the number of people reasonably anticipated to be exposed in the absence of any future EPA action for each medium for the following time frames:

MEDIUM	<2yrs	<10yrs	>10yrs
Soil/Mine Waste	160	480	>1000
Surface Water	NA	NA	NA
Ground Water	NA	NA	NA

Discuss the likelihood that the above exposures will occur:

The likelihood that these exposures will occur is high, for the following reasons:

- Contaminated areas are in easily accessible unfenced yards and driveways. They are accessible to residents of that property as well as residents of neighboring properties and visitors to the property who either live in Superior or elsewhere.
- Contamination is in soil that is at or near the surface, and vegetative cover is often sparse or non-existent (often due to the inability of many lower income residents to pay for such upkeep). This provides a direct exposure pathway.
- Potential receptors are plentiful, and include sensitive individuals such as children who are likely to be exposed to the contaminated soils in residential areas where they play.

Other Risk/Exposure Information?

Contamination left in driveways and roadways can be spread throughout town by vehicle tires that come in contact with these wastes.

Criteria #2 – SITE/CONTAMINANT STABILITY (Weight Factor = 5)

Describe the means/likelihood that contamination could impact other areas/media given current containment:

Contamination in soils in OU1 is often completely unvegetated or poorly vegetated. This lack of effective cover exposes the contamination to migration via wind or surface water runoff. Contamination in driveways can be transported to other areas on the tires of vehicles.

Contaminated materials stored at the airport repository are controlled in the short-term but not the long term. Eventually, they could pose a threat to surface water and groundwater via runoff and infiltration, because of changes to the previously closed airport repository in 2010 and 2011 (see comment below).

Are the contaminants contained in engineered structure(s) that currently prevents migration of contaminants? Is this structure sound and likely to maintain its integrity?

The airport repository contains contaminated soils excavated during emergency removals. It is an engineered structure that was originally designed for long-term disposal of the contaminated soil excavated in 2002. It was capped by EPA in 2002, after emergency removals were completed. However, this repository can no longer serve the purpose of long-term storage and the soils excavated by EPA's Removal Branch in 2010 and 2011 were added on top of the cap, in anticipation of ultimately being transported to the Wood Gulch Repository.

Are the contaminants in a physical form that limits the potential to migrate from the site? Is this physical condition reversible or permanent?

No. The contaminants in fill placed in town and at the airport can continue to migrate through erosion and air dispersion to other receptors unless they are removed from the site and disposed of in the Wood Gulch Repository, an engineered containment constructed for this purpose in 2011.

Are there institutional physical controls that currently prevent exposure to contamination? How reliable is it estimated to be?

No. Because the contamination is on a variety of individual privately-owned properties, there are no existing physical barriers or institutional controls. It would be very difficult, if not impossible, to implement such controls on these properties because they would limit development. The properties are currently freely accessed by owners, tenants, and visitors. Physical controls have been placed at the airport repository.

Other information on site/contaminant stability?

Contaminants can also become mobilized through manmade actions such as excavations and transportation. Engineering controls will be used to minimize exposure to contaminants during the removal, transportation, and disposal activities of this project.

Criteria #3 – CONTAMINANT CHARACTERISTICS (Weight Factor = 3)

(Concentration, toxicity, and volume or area contaminated above health based levels)

List Principle Contaminants (Please provide average and high concentrations.):

*Media	Subarea	Contaminant	Concentrations (ppm)		
			Low	Mean	High
Soil	All properties identified for remediation (CLP analysis)	Antimony	1.3	84	3,460
		Arsenic	4.5	117	2,660
		Lead	16.3	707	13,900

**Media: OU1 focused solely on shallow soils in residential and other properties at the site.*

Describe the characteristics of the contaminant with regards to its inherent toxicity and the significance of the concentrations and amount of the contaminant to site risk. *(Include the clean up level of the COCs discussed.)*

Site investigations have documented widespread use of mine waste from the IMM as construction fill throughout the community. This waste contains elevated concentrations of numerous metals, but antimony, arsenic, and lead are present in concentrations that pose unacceptable risks to human health. Lead is of the greatest concern due to its non-carcinogenic effects on the neural development of children. However, arsenic is a known human carcinogen and its ingestion has been associated with increased risk of cancer of the liver, bladder, kidneys, prostate, and lungs. For all properties in OU1, the cleanup criteria set in the ROD for soils is 100 ppm for arsenic and 400 ppm for lead. Antimony is present with less regularity and the cleanup criterion in the ROD is 130 ppm for antimony.

Arsenic and lead do not degrade significantly with time. In residential soils, they are of greatest concern via the incidental ingestion pathway. The presence of these contaminants in bare or sparsely-vegetated soils at residential properties where children have free access is of great concern.

Describe any additional information on contaminant concentrations which could provide a better context for the distribution, amount, and/or extent of site contamination. *(e.g. frequency of detection/outlier concentrations, exposure point concentrations, maximum or average concentration values, etc.....)*

Because of the random and long-term pattern of importing mine waste into individual properties in Superior, the RI set out to screen as many properties as possible. EPA believes that over 95 percent of the properties in town were screened. Those that could not be screened were either where access was refused, or where access could not be obtained because there was no house or owner/tenant present.

In total, EPA screened 588 properties following guidelines in the lead handbook and other documents. A total of 7,209 composite samples were analyzed using x-ray fluorescence (XRF) and 988 samples received both XRF and laboratory analysis. Elevated concentrations of lead and arsenic were found in a relatively low percentage of the properties, and concentrations in residential samples were below the XRF's level of detection in 82 percent the samples for arsenic and in 35 percent of samples for lead. About 11 percent of the properties were identified as

having moderate or high concentrations of lead or arsenic.

Some of these properties had concentrations that were high enough (>3000 ppm of lead or 400 ppm of arsenic) to warrant emergency removal in either the 2010 or 2011 TCRAs. Others had concentrations that did not warrant emergency removal or whose concentrations were not know at the time the removals were scheduled but exceed the cleanup criteria established in the ROD (400 ppm of lead or 100 ppm of arsenic). Those properties are identified in the ROD for removal.

Results of the screening verified a generally random pattern of contaminant distribution, found mainly in shallow soils. There is no plume or centralized source from which the contaminants emanate, and the highest concentrations have been removed. Many of the areas of contamination are driveways constructed of mine waste which are easy to identify and remove.

EPA believes that the removal of these discrete areas of contamination will easily and efficiently reduce the human health risk throughout OU1 to acceptable levels, allowing for less reliance on institutional controls and moving the site toward construction completion.

Other information on contaminant characteristics?

Contamination on site is relatively isolated and its location is well documented. The contamination is generally shallow and is found in areas where mine waste was used as fill or was overspill from fill. It was not widely broadcast or used as soil amendments, and it did not emanate from a plume. The vast majority of properties in town (>90 percent) do not have COCs present above levels of concern.

Criteria #4 – THREAT TO SIGNIFICANT ENVIRONMENT (Weight Factor = 3)

(Endangered species or their critical habitats, sensitive environmental areas.)

Describe any observed or predicted adverse impacts on ecological receptors including their ecological significance, the likelihood of impacts occurring, and the estimated size of impacted area:

In order to allow unacceptable human health risk to be addressed as quickly as possible, OU1 was created as a separate OU that focused only on the soils in residential and other areas of the site. A remedial investigation will be conducted as part of OU2 that will assess the impacts of site-related contamination of groundwater and surface water, and will also include an ecological risk assessment. Because the areas where mine waste was placed are generally not near surface water, and are several feet above groundwater, it is unlikely surface water or groundwater impacts will be found. Thus, there are no known threats at this time to ecological receptors from contamination in OU1. Removal of the contaminated soils in OU1 will certainly eliminate the potential for contaminants to migrate to areas that would impact ecological receptors via wind erosion, surface water runoff, and tracking on vehicle tires.

Would natural recovery occur if no action was taken? ☐ Yes ☒ No
If yes, estimate how long this would take.

The contamination in these soils will continue to be an unacceptable source of arsenic and lead if not removed.

Other information on threat to significant environment?

None.

Criteria #5 – PROGRAMMATIC CONSIDERATIONS (Weight Factor = 4)

(Innovative technologies, state/community acceptance, environmental justice, redevelopment, construction completion, economic redevelopment.)

Describe the degree to which the community accepts the response action.

The response action was described in the proposed plan and presented to the community for public comment. EPA received no public comment during the 30-day comment period. Local government officials have been kept abreast of progress and plans throughout the RI/FS process and discussions with them indicate that there are no serious concerns with the remedy.

Describe the degree to which the State accepts the response action.

The State of Montana has indicated that they are in agreement with the response action as described in the proposed plan and ROD. Removal of yards with unacceptable contamination in all three depth intervals at the site and using individual sampling areas for the exposure unit (rather than property-wide) addressed their concerns regarding this action.

Describe other programmatic considerations, e.g.; natural resource damage claim pending, Brownfields site, use of innovative technology, construction completion, economic redevelopment, environmental justice, etc…

- **Environmental Justice.** Economic justice concerns may apply to shallow soils in residential areas of OU1 and would be addressed through this remedy. Exposure to lead is of greatest concern in children, and children from economically-disadvantaged homes are likely to have a greater rate of exposure, due to lack of a good vegetative cover over the contaminated soils and to the possibility of more time spent outside in contact with the soils. It is unknown whether the specific properties identified for remediation are those of people in low-income category. However, because 10.4 percent of the local families live below the poverty line, it is likely that at least 10 percent of the properties identified for remediation are those of low income.
- **Redevelopment**. Redevelopment concerns are a primary motivator for removal of the soils stockpiled at the airport repository. As described under Criteria 2, the airport repository is no longer a viable long-term repository. Also, community sentiment will not allow it to be modified to once again serve as a long-term repository. The local government reports that having the repository on airport property has made it difficult or impossible for them to get grants to update or expand the airport facility. They want the materials removed. Redevelopment also motivates the removal of shallow soils in residential areas. The community is anxious to have that contamination removed, believing it will remove the stigma that may negatively impact local home sales.
- **Remedial Action Completion.** The remedy for OU1 as described in the ROD is very simple and easy to implement. It can be done quickly and completely with minimal impact and cost. The Remedial Design step will be simplified greatly because of the work performed under TCRAs at the site, and because the Removal Program will be conducting the removals under the Remedy. Once the soils are excavated, there will be no long-term treatment or monitoring required in OU1. Construction will be complete. In addition, the Wood Gulch Repository was constructed specifically to accept these soils and is ready to accept them.

Figure 1. Site Location Map

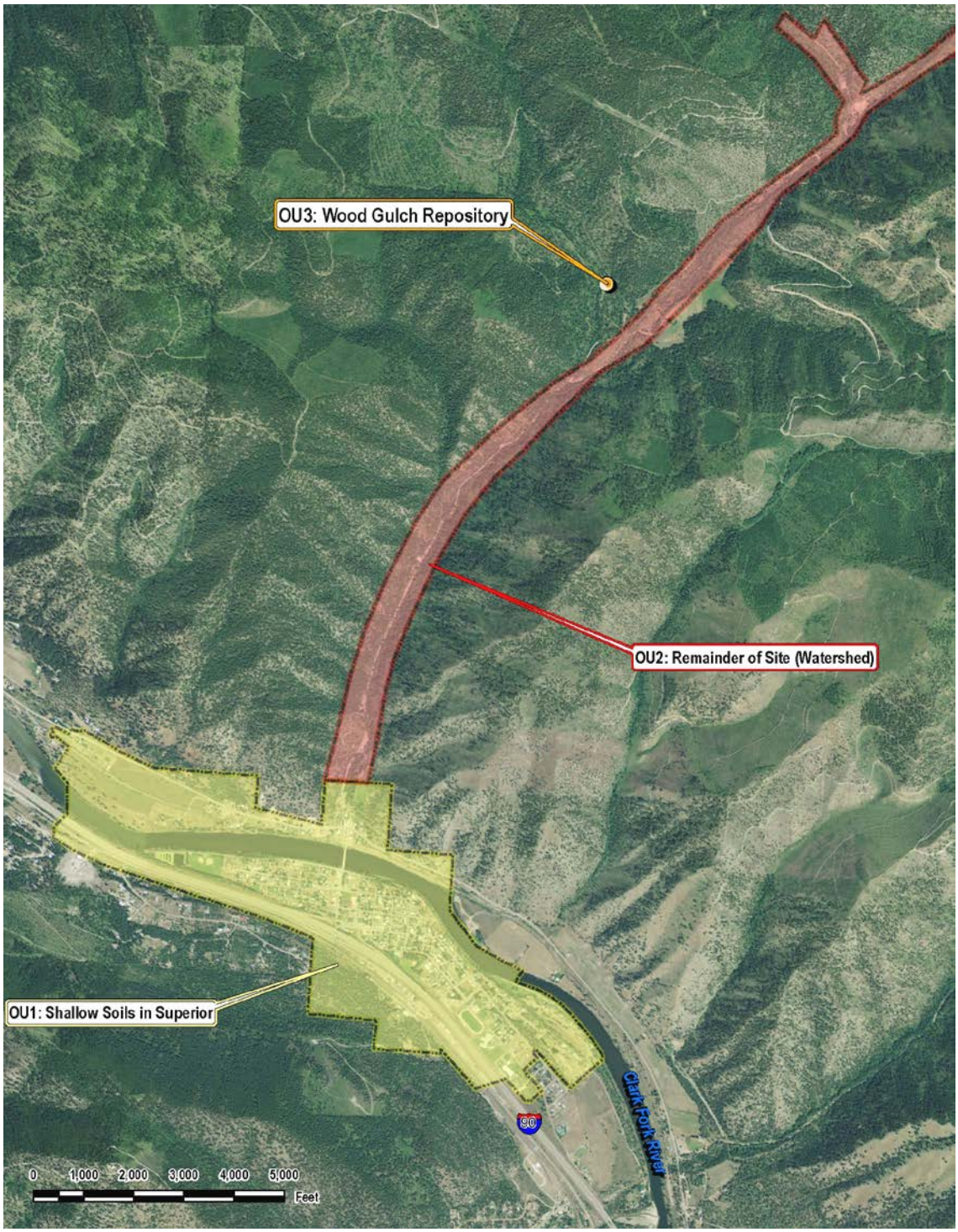

Figure 2. Locations of OUs at Site

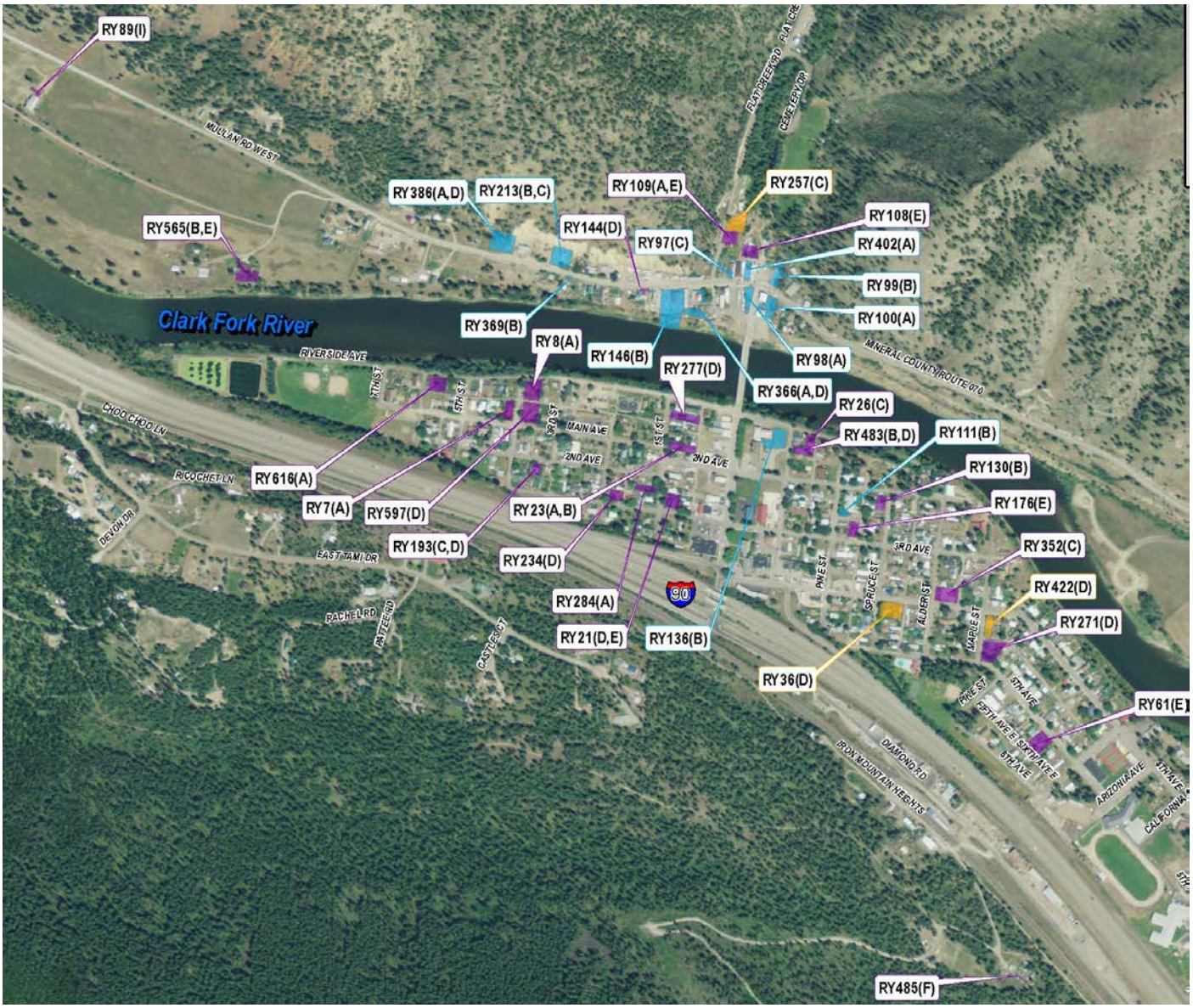

Figure 3. Locations of Properties Identified for Remediation